

μ A711

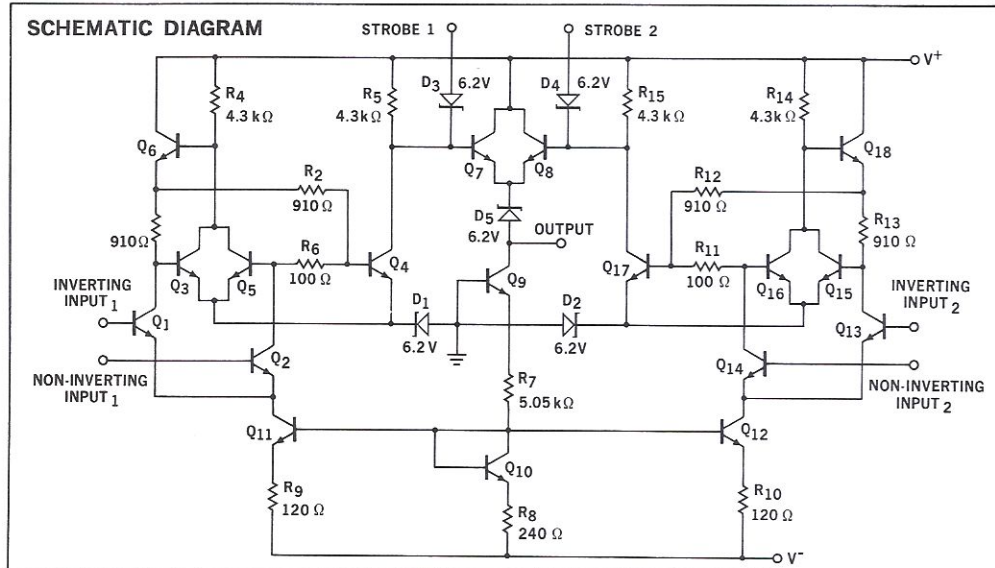
DUAL COMPARATOR

FAIRCHILD LINEAR INTEGRATED CIRCUITS

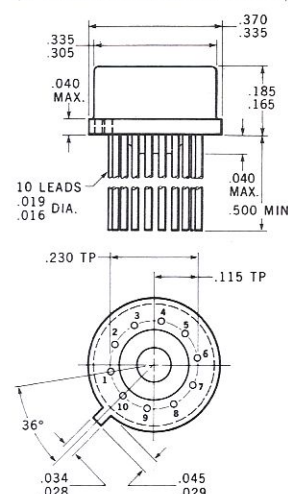
GENERAL DESCRIPTION - The μ A711 is a dual, differential voltage comparator intended primarily for core-memory sense amplifier applications. The device features high accuracy, fast response times, large input voltage range, low power consumption and compatibility with practically all integrated logic forms. When used as a sense amplifier, the threshold voltage can be adjusted over a wide range, almost independent of the integrated circuit characteristics. Independent strobing of each comparator channel is provided, and pulse stretching on the output is easily accomplished. Other applications of the dual comparator include a window discriminator in pulse height detectors and a double-ended limit detector for automatic Go/No-go test equipment. The μ A711, which is similar to the μ A710 differential comparator, is constructed on a 40-mil square silicon chip using the Fairchild Planar* epitaxial process.

ABSOLUTE MAXIMUM RATINGS

Positive Supply Voltage	+14.0 V
Negative Supply Voltage	-7.0 V
Peak Output Current	50 mA
Differential Input Voltage	± 5.0 V
Input Voltage	± 7.0 V
Strobe Voltage	0 to +6.0 V
Internal Power Dissipation (Note 1)	300 mW
Operating Temperature Range	-55°C to +125°C
Storage Temperature Range	-65°C to +150°C
Lead Temperature (Soldering, 60 sec.)	300°C

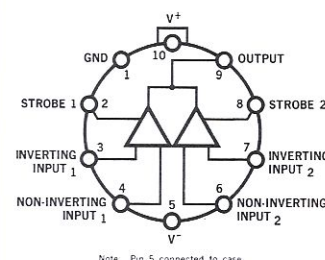


Notes on page 2

PHYSICAL DIMENSIONS
 (In accordance with JEDEC TO-100)


NOTES: All dimensions in inches.
Leads are gold-plated kovar.
Package weight is 1.32 grams.

ORDER PART NO.
U5F771131X

TO-5 CONNECTION
DIAGRAM
(TOP VIEW)


* Planar is a patented Fairchild process.

313 FAIRCHILD DRIVE, MOUNTAIN VIEW, CALIFORNIA, (415) 962-5011, TWX: 910-379-6435

FAIRCHILD
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FAIRCHILD LINEAR INTEGRATED CIRCUITS μ A711

ELECTRICAL CHARACTERISTICS $(T_A = 25^\circ\text{C}, V^+ = 12.0\text{ V}, V^- = -6.0\text{ V}$ unless otherwise specified)

Parameter (see definitions)	Conditions	Min.	Typ.	Max.	Units
Input Offset Voltage	$V_{\text{out}} = +1.4\text{ V}, R_S \leq 200\ \Omega, V_{\text{CM}} = 0$		1.0	3.5	mV
	$V_{\text{out}} = +1.4\text{ V}, R_S \leq 200\ \Omega$		1.0	5.0	mV
Input Offset Current	$V_{\text{out}} = +1.4\text{ V}$		0.5	10.0	μA
Input Bias Current			25	75	μA
Voltage Gain		750	1500		
Response Time (Note 2)			40		ns
Strobe Release Time			12		ns
Input Voltage Range	$V^- = -7.0\text{ V}$	± 5.0			V
Differential Input Voltage Range		± 5.0			V
Output Resistance			200		Ω
Positive Output Level	$V_{\text{in}} \geq 10\text{ mV}$		4.5	5.0	V
Loaded Positive Output Level	$V_{\text{in}} \geq 10\text{ mV}, I_O = 5\text{ mA}$	2.5	3.5		V
Negative Output Level	$V_{\text{in}} \geq 10\text{ mV}$	-1.0	-0.5	0	V
Strobed Output Level	$V_{\text{strobe}} \leq 0.3\text{ V}$	-1.0		0	V
Output Sink Current	$V_{\text{in}} \geq 10\text{ mV}, V_{\text{out}} \geq 0$	0.5	0.8		mA
Strobe Current	$V_{\text{strobe}} = 100\text{ mV}$		1.2	2.5	mA
Positive Supply Current	$V_{\text{out}} \leq 0$		8.6		mA
Negative Supply Current			3.9		mA
Power Consumption			130	200	mW

The following specifications apply for $-55^\circ\text{C} \leq T_A \leq +125^\circ\text{C}$:

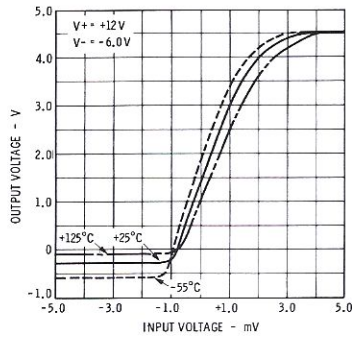
Input Offset Voltage (Note 3)	$R_S \leq 200\ \Omega, V_{\text{CM}} = 0$			4.5	mV
	$R_S \leq 200\ \Omega$			6.0	mV
Input Offset Current (Note 3)				20	μA
Input Bias Current				150	μA
Temperature Coefficient of Input Offset Voltage			5.0		$\mu\text{V}/^\circ\text{C}$
Voltage Gain		500			

NOTES:

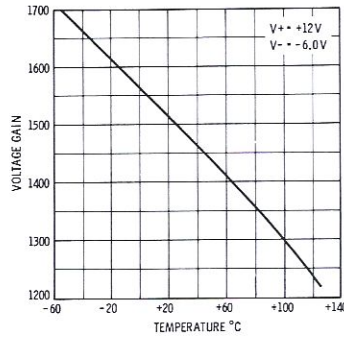
- (1) Rating applies for case temperatures to $+125^\circ\text{C}$; derate linearly at $5.6\text{ mW}/^\circ\text{C}$ for ambient temperatures above 105°C .
- (2) The response time specified (see definitions) is for a 100-mV input step with 5-mV overdrive.
- (3) The input offset voltage (see definitions) is specified for a logic threshold voltage of 1.8 V at -55°C , 1.4 V at $+25^\circ\text{C}$ and 1.0 V at $+125^\circ\text{C}$.

TYPICAL PERFORMANCE CURVES

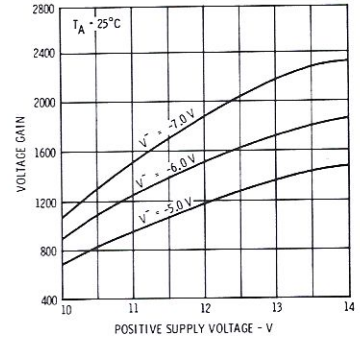
VOLTAGE TRANSFER CHARACTERISTIC



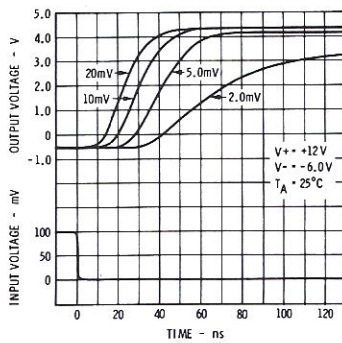
VOLTAGE GAIN AS A FUNCTION OF AMBIENT TEMPERATURE



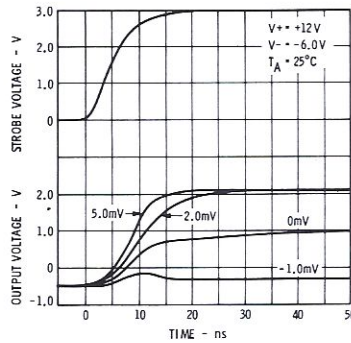
VOLTAGE GAIN AS A FUNCTION OF SUPPLY VOLTAGES



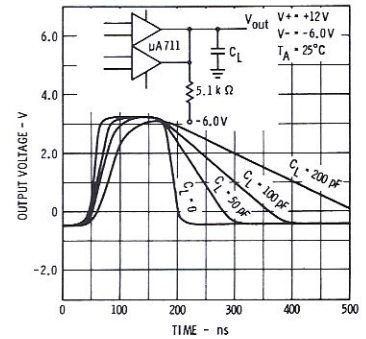
RESPONSE TIME FOR VARIOUS INPUT OVERDRIVES



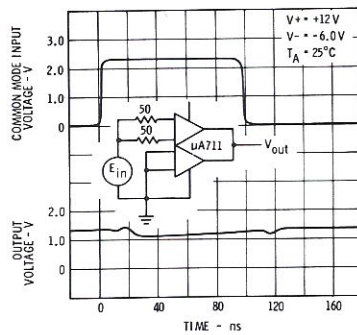
STROBE RELEASE TIME FOR VARIOUS INPUT OVERDRIVES



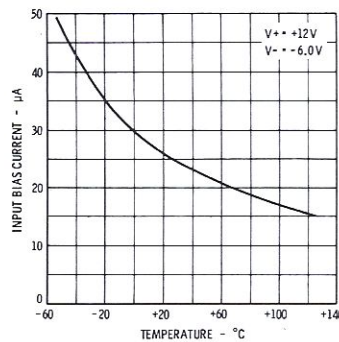
OUTPUT PULSE STRETCHING WITH CAPACITIVE LOADING



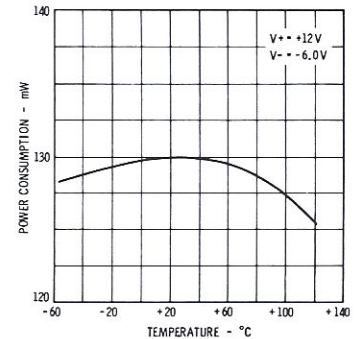
COMMON MODE PULSE RESPONSE



INPUT BIAS CURRENT AS A FUNCTION OF AMBIENT TEMPERATURE



POWER CONSUMPTION AS A FUNCTION OF AMBIENT TEMPERATURE



DEFINITIONS

LOGIC THRESHOLD VOLTAGE - The approximate voltage at the output of the comparator at which the loading logic circuitry changes its digital state.

INPUT OFFSET VOLTAGE* - The voltage between the input terminals when the output is at the logic threshold voltage. The input offset voltage may also be defined for the case where two equal resistances are inserted in series with the input leads.

INPUT OFFSET CURRENT* - The difference in the currents into the two input terminals with the output at the logic threshold voltage.

INPUT BIAS CURRENT* - The average of the two input currents.

INPUT VOLTAGE RANGE* - The range of voltage on the input terminals for which the comparator will operate within specifications.

DIFFERENTIAL INPUT VOLTAGE RANGE* - The range of voltage between the input terminals for which operation within specifications is assured.

VOLTAGE GAIN* - The ratio of the change in output voltage to the change in voltage between the input terminals producing it with the DC output level in the vicinity of the logic threshold voltage.

RESPONSE TIME* - The interval between the application of an input step function and the time when the output crosses the logic threshold voltage. The input step drives the comparator from some initial, saturated input voltage to an input level just barely in excess of that required to bring the output from saturation to the logic threshold voltage. This excess is referred to as the voltage overdrive.

STROBE RELEASE TIME* - The time required for the output to rise to the logic threshold voltage after the strobe terminal has been driven from the zero to the one logic level. Appropriate input conditions are assumed.

POSITIVE OUTPUT LEVEL* - The DC output voltage in the positive direction with the input voltage equal to or greater than a minimum specified amount.

NEGATIVE OUTPUT LEVEL* - The DC output voltage in the negative direction with the input voltage equal to or greater than a minimum specified amount.

OUTPUT SINK CURRENT - The maximum negative current that can be delivered by the comparator.

PEAK OUTPUT CURRENT - The maximum current that may flow into the output load without causing damage to the comparator.

OUTPUT RESISTANCE* - The resistance seen looking into the output terminal with the DC output level at the logic threshold voltage.

STROBED OUTPUT LEVEL* - The DC output voltage, independent of input voltage, with the voltage on the strobe terminal equal to or less than a minimum specified amount.

STROBE CURRENT - The maximum current drawn by the strobe terminal when it is at the zero logic level.

POWER CONSUMPTION - The DC power into the amplifier with no output load. The DC power will vary with signal level, but is specified as a maximum for the entire range of input-signal conditions.

*These definitions apply for either side with the other disabled with the strobe.